

DOCUMENT RESUME

ED 429 291

CS 216 623

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TITLE Some Basic Writers, Some Modes of Representation, and Some Challenges in Learning To Write Scientific Discourse.  
PUB DATE 1999-00-00  
NOTE 30p.  
PUB TYPE Reports - Research (143)  
EDRS PRICE MF01/PC02 Plus Postage.  
DESCRIPTORS \*Basic Writing; Discourse Analysis; \*Discourse Modes; \*Grammar; Higher Education  
IDENTIFIERS \*Academic Discourse; \*Basic Writers; Science Writing; Speaking Writing Relationship; Writing Style

ABSTRACT

This paper describes some aspects of essays produced by students who as writers in the United States would commonly be called "basic writers." The paper focuses primarily on the grammatical subjects in these essays and offers a view of how closely grammatical structure typical in speech correspond to those typical in writing. It reports on the results of an in-class essay writing assignment given to basic writers in which the grammatical subject of the main clause was examined--in general, the subjects were short, and the writers did not use many complex syntactic structures in their subjects. The paper speculates about the challenges that such basic writers will probably face as they try to write academic discourse, especially discourse like that produced by writers in the sciences who work with a great deal of information that has been generated and stored up over time. Contains a table of data and 34 references. (NKA)

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Some Basic Writers, Some Modes of Representation,  
and Some Challenges in Learning to Write Scientific Discourse

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Some Basic Writers, Some Modes of Representation,  
and Some Challenges in Learning to Write Scientific Discourse

In this paper I describe some aspects of essays produced by students who as writers in the United States would commonly be called basic writers. I will focus primarily on the grammatical subjects in these essays and will offer some exploratory analyses of why those subjects are quite short. In this process, I will also offer a view of how closely grammatical structures typical in speech correspond to those typical in writing. Further, I will speculate about the challenges that basic writers such as are represented here will probably face as they try to write academic discourse, especially discourse like that produced by writers in the sciences, who work with a great deal of information that has been generated and stored up over time.

The Background to This Study

I was led to focus on grammatical subjects in a sample of basic writing through studying the length of grammatical subjects in the kind of writing that is probably the closest to the center of scientific research, that which, according to Kinneavy (1971), is found in the "small and compact articles and reports which make up the large majority of scientific writing today" (p. 172). In such articles, scientists write to other scientists, usually to those working in the same academic field or subfield. And usually the scientists report on experimental work, not on theoretical explorations.

I worked with four research articles published in 1988; the authors and titles of these are as follows:

1. P. R. Blazewicz and J. C. Miller, "Nonlinear Optical Processes in Xenon and Krypton Studied by Two-Color Multiphoton Ionization," *Physical Review A* (3,977 words).
2. A. Kintanar, T. M. Alam, W. Huang, D. C. Schindele, D. E. Wemmer, and G. Drobny, "Solid-State <sup>2</sup>H NMR Investigation of Internal Motion in 2'-Deoxythymidine," *Journal of the American Chemical Society* (4,091 words).
3. E. H. De Lucia, W. H. Schlesinger, and W. D. Billings, "Water Relations and the

Maintenance of Sierran Conifers on Hydrothermally Altered Rock," *Ecology* (3,461 words).

4. M. H. Lebel, B. J. Freij, G. A. Syrogiannopoulos, D. F. Chrane, M. J. Hoyt, S. M. Stewart, B. D. Kennard, K. D. Olsen, and G. H. McCracken, Jr., "Dexamethasone Therapy for Bacterial Meningitis," *New England Journal of Medicine* (4,267 words).

In these articles I examined all the grammatical subjects in the abstract and the main text, omitting the grammatical subjects in captions for graphs and pictures and in parenthetical expressions giving details of statistical analyses. I proceeded t-unit by t-unit, counting the number of words in the grammatical subject of the main clause in each. I worked with a definition of grammatical subjects that is consistent with those of many traditional grammars. That is, I did not count *there* and *it* as subjects when they functioned as what most traditional grammars would call expletives (as in "There are four instruments in this room. It is amazing that they are all working well."). Subjects as defined in these traditional terms usually correspond to sentence topics (cf. Witte, 1983), and sentence topics give us what is probably the best indication of what writers intend that their readers focus on as they move through texts (cf. Vande Kopple, 1989).

The four research articles contained 780 t-units. The words in the grammatical subjects of the main clauses in these t-units added up to a total of 4,689 words. Thus the average length of the grammatical subjects in the four articles is 6.011 words. I also counted how many of the subjects were as long as or longer than the rest of the t-unit that they appeared in. One hundred and sixty-three of the 780 subjects (20.897%) fell into this category. (Additional data on these subjects appear in Vande Kopple, 1994.)

I know of no figures for the lengths of grammatical subjects in other kinds of academic discourse; without knowledge of such figures, I can advance only tentatively the claim that the grammatical subjects in scientific discourse are, in general, markedly long.

However, it is a fact that in the research articles I examined there are many specific grammatical subjects that are very long indeed. Of the 780 total subjects, 122 are over ten words long. Such subjects would probably attract attention as being long in virtually any kind of discourse other than the scientific. In many of these long subjects, the headword of the subject

noun phrase has quite extensive premodification as well as postmodification. Here is an example of such a subject that comes from the Methods Section of the medical article (here as elsewhere in this article the grammatical subjects in examples are italicized):

To reduce the effect of interassay variability on measurements of lactate concentration, *initial and 24-hour cerebrospinal fluid specimens from 19 and 15 patients in the dexamethasone groups in Studies 1 and 2, and from 18 and 14 patients in the placebo groups* were assayed on the same day with use of an automated enzymatic technique. (Lebel et al., 1988, p. 965)

In Vande Kopple (1994), I elaborate on three pressures that are probably coming to bear on the research scientists whose reports I studied so that they produce the long subjects that they do: (1) the pressure to be precise, (2) the pressure to be as economical as possible in words, mainly by incorporating into nominal expressions material that would ordinarily require a clause for its expression, and (3) the pressure to be efficient and progressive in constructing claims that are meant to be taken as true and as remaining true within a framework of knowledge that has been built up over time.

As I saw more and more clearly how extensive must be the frameworks of knowledge within which research scientists work and write, I began to wonder how striking the contrast would be between scientists' and basic writers' practices in constructing grammatical subjects. The situation in which basic writers work and write would appear to be much different from that of research scientists, particularly in that few basic writers can be characterized as contributing to or actively participating in an academic field in which a great deal of information has been built up and in that the prose of basic writers is usually judged to require more than the usual amounts and degrees of remediation. Seeing how the subject-constructing practices of research scientists differ from those of basic writers promises to lead to other insights into how the style of scientific writing might differ from the style of many basic writers. And all such insights promise to aid those who try to help students who wish to move into serious work in the sciences to write in appropriate ways.

### The Sample of Basic Writing

The students who contributed essays to the sample of basic writing were in one or the other of two special sections of freshman English that I taught at a four-year liberal-arts college. All of them had been preselected for this class on the basis of their performance on a test that they took during their orientation period and that covered grammar, usage, punctuation, and rhetoric. They were all deemed to need more help with writing than would be available in a regular section of freshman English (most such sections have about twenty-three students). The institutional arrangement gave them extra help by holding these special classes to a maximum of seventeen students and mandating that the students also enroll in a non-credit half-course covering grammar, usage, and punctuation.

During the second class session for each of these special sections, I gave all the students an in-class writing assignment. None of them had ever seen the topic for the assignment before they walked into class. The topic was the one labelled Topic A by M. Morenberg, D. Daiker, and A. Kerek (1978), who had adapted it from the Educational Testing Service and had used it in sentence-combining research. Topic A reads as follows:

Each of us behaves differently when we move from one group to another. We play different roles in different situations. For example, we do not act at home precisely as we act on dates, in the classroom, or before an employer. Nor do we behave with a single friend as we behave with a group of friends.

In an extensive and detailed essay, develop your ideas about the changes in our behavior. Use specific illustrations from your own personal experience, from observations of others, or from books, movies, and television. You may want to explore questions of your own or answer questions like these: Why do we act differently in different situations? Are the changes in our behavior motivated by some need? Are other people misled by our behavior changes? Do such changes indicate something insincere or hypocritical about us? What happens when we do not change our behavior from one

situation to another?

After I read this topic over with the students and answered their few questions, they had fifty minutes in which to think about the topic and respond to it in writing. Many of them were finished with their essays before the fifty minutes had elapsed.

After the writing session, I had the essays coded and typed up, during which processes all spelling and mechanical errors were corrected "in an effort to eliminate the 'halo effect' of legible handwriting and technical correctness on raters' judgments" (Gebhard, 1978, p. 212). Then I asked three of my colleagues to grade the essays as they would have if the essays had been submitted to them for credit in freshman English. When they were finished, I averaged the grades each essay had received and sorted out the fifteen with the lowest average grades. The average grade for these fifteen was a D+.

Some data on the writers of these fifteen essays, all of whom spoke English as their first language, were available. Scores on the English section of the American College Test were available for ten students. Their average standard score was 14.1. The local percentiles for these ten students were as follows: 05, 24, 19, 08, 30, 01, 05, 14, 01, and 05. Scores on the verbal section of the Scholastic Aptitude Test were available for two students. Both had a standard score of 310; the two local percentiles were 04 and 02. The average grade for twelve of these students in all of their high-school English classes was between a C and a C-.

#### The Nature of Sentence Subjects in the Sample

In these fifteen essays, I examined the grammatical subject of the main clause in each t-unit. There were 263 such subjects. In general, they were short, their average length being only 1.79 words. The average length of the longest subject in each essay was 6.27 words. These writers did not use many complex syntactic structures in their subjects. Simple noun-phrase structures (pronouns, unmodified nouns, and determiner-plus-noun combinations) numbered 223, or 84.7% of the total number of subjects. Among the pronouns there were 146 personal pronouns, or 55.51% of the total number of subjects (these data appear in Table 1).

Table 1

## Grammatical Subjects in the Sample of Basic Writing

Total Subjects	263
	(average length = 1.79 words)
Simple noun phrases (pronouns, unmodified nouns, and determiner-plus- noun combinations) as subjects	223
	(84.7%)
Personal pronouns as subjects	146
	(55.51%)

Among the 263 subjects, there were only five nominalizations, two clauses, and one infinitive. The subjects in the basic writing, therefore, are generally short and simple.

## Related Findings

Findings similar to mine have been reported more than once over the course of the last fifteen to twenty years by other researchers. R. L. Cayer and R. K. Sacks (1979) report that the basic writers they studied "elaborated the predicates of both their oral and written discourse much more than they did the subject portions" (p. 125). In the case of the oral discourse, this finding did not strike them as unusual, but in the case of the written discourse, this finding struck them as noteworthy. In fact, based on research by Kellogg Hunt (1977) showing that as writers mature, they increasingly elaborate their sentence subjects, Cayer and Sacks claim that the basic writers

they studied "adjusted minimally to the demands for increased elaboration of the subject portion of their discourse in the written task . . ." (1979, p. 125).

Why might written texts generally encourage or correlate with more elaboration of sentence subjects than spoken texts do? Cayer and Sacks detail the view that links explicitness and elaboration to the hypothesized relative autonomy of written texts. Speech usually occurs in a context in which people can respond directly and immediately to one another. Speakers do not have to be intensely concerned about whether their hearers can identify what they are talking about since if the hearers have trouble identifying what is referred to in sentence subjects, they will give a quizzical look or interrupt the speakers. In such a situation, speakers usually need to be only minimally explicit in their sentence subjects. Speakers, say Cayer and Sacks, tend "to eliminate or drastically abbreviate the subject while stressing the predicate" (1979, p. 122).

Writers, however, usually cannot receive direct and immediate feedback from their readers. As a result, say Cayer and Sacks, they must include more information to identify things than they would in speech. To do this, they must use "much more explicit and elaborate language . . ." (1979, p. 126), employing complex syntactic structures to expand both the subjects and predicates of their sentences. Cayer and Sacks maintain that the basic writers they studied had not learned how to expand their written subjects.

Much in these claims is corroborated by others. For example, in a study of domestic conversation, David Crystal (1979) found that 77% of the clauses had very short and simple elements, mainly pronouns, as subjects. In a study of some speech and writing produced by members of various social classes, Millicent E. Poole and T. W. Field (1976) discovered that the average "pre-verb length" was greater for writing than for speaking, and Mina Shaughnessy (1977) has pointed out that "unaware of the ways in which writing is different from speaking, he [the basic writer] imposes the conditions of speech upon writing" (p. 79).

However, these claims do not tell the full story about how closely syntactic structures in speech correspond to those in writing and about how writers gain kinds of proficiency.

Another explanation that some scholars advocate centers on the psychology of basic

writers. For instance, Andrea Lunsford (1980) examined the sentence subjects in some basic writing and found that in this writing "the focus is consistently on the writer or on those with whom he identifies . . ." (p. 286). Lunsford found many personal pronouns serving as subjects. She concludes that these writers represent "the egocentric stage of cognitive development . . ." (1980, p. 284). The writers in my sample, too, seem egocentric. As I noted, 146 of their 263 subjects are personal pronouns, and 136 subjects refer to the writers or to people closely associated with them (for example, boyfriends, sisters, or parents). However, in itself this explanation also does not account fully for the large number of short subjects that these basic writers produced. Writers could be egocentric, focusing mainly or only on themselves, and still produce fairly long subjects often (such as "Changes in my behavior pattern from group to group" or "My different reactions at a movie," both among the longer subjects in the sample).

#### Modes of Representation

I believe that the explanation that comes closest to telling the full story about basic writers and simple syntactic subjects relates to work that M. A. K. Halliday has done. When he examines different linguistic styles or modes of representing experience, he works with a continuum. (For related work, see Rulon Wells (1960) on nominal and verbal styles.) At one pole is a style Halliday calls synoptic. As represented in this style, "the world is a world of things, rather than one of happening; of product, rather than of process; of being rather than becoming" (1987a, pp. 146-147). When Halliday uses a metaphor for this style, he calls the style crystalline. The synoptic style is usually associated with writing, particularly with carefully planned, formal writing. In many cases, writing, a product or thing, makes the world look like a product or thing; in other words, such writing makes the world look like itself.

The chief characteristic of synoptic style is lexical density, which is "the proportion of lexical items (content words) to the total discourse" (Halliday, 1987b, p. 60). Lexical density can be measured in several ways; I will, as Halliday frequently does, count the proportion of nouns, verbs, adjectives, and adverbs to unembedded clauses. If you do not work in terms of

unembedded clauses, you have to count some words twice, once for the overarching or matrix clause and once for the embedded clause.

One example of prose with a high degree of lexical density Halliday takes from Scientific American:

Private civil actions at law have a special significance in that they provide an outlet for efforts by independent citizens. Such actions offer a means whereby the multiple initiatives of private citizens, individually or in groups, can be brought to bear on technology assessment, the internalization of costs and environmental protection. They constitute a channel through which the diverse interests, outlooks and moods of the general public can be given expression.

The current popular concern over the environment has stimulated private civil actions of two main types. (cited in Halliday, 1987b, p. 61)

Halliday computes the lexical density for this extract at 9.6 (lexical words) to 1 (unembedded clause).

Here is an additional example of some prose with a high degree of lexical density; this sentence, which comes from the medical article mentioned earlier, appears here with its lexical items underlined: "In conclusion, the administration of dexamethasone significantly reduced concentrations of protein and lactate and increased glucose concentrations in the cerebrospinal fluid approximately 24 hours after the beginning of treatment, and significantly reduced the incidence of moderate to profound bilateral sensorineural hearing impairment" (Lebel et al., 1988, p. 971). This sentence is made up of one main clause and contains twenty-seven lexical words (counting 24 as one lexical word); it, therefore, has a lexical density of 27 (lexical words) to 1 (unembedded clause).

Prose becomes lexically dense primarily via very complex noun phrases, structures that George W. Smith labels "writers' densely informative noun phrases" (1991, p. 84). Often the head noun in a noun phrase will be a nominalization, and the head can be both pre- and post-modified. In the last sentence of the example from Scientific American, there are two examples of

nominalizations both pre- and post-modified: "The current popular **concern** over the environment" and "private civil **actions** of two main types."

At the other end of Halliday's continuum is a style that he calls dynamic. It represents the world in terms of happenings, processes, becomings. When Halliday uses a metaphor to describe this mode of representation, he calls the mode a dance. The dynamic style is usually associated with speech, especially with spontaneous and unselfconscious speech. This is the language "we learn as children--and carry with us throughout life" (Halliday, 1987a, p. 147). Often speech, an action or process, also makes the world look like an action or process; in other words, it makes the world look like itself.

The chief characteristic of the dynamic style is grammatical intricacy. Sentences in the dynamic style will typically include many clauses, some hypotactically and some paratactically related to others. The more spontaneous and unselfconscious the speech, the more grammatically intricate it is likely to be. Sentences in this style can get so complex that sometimes those who utter them, on hearing them replayed, refuse to acknowledge that they did say them or even could have said them.

Halliday gives many examples of sentences in the dynamic style. Here is one recorded in the talk of a dog-breeder:

I had to wait, I had to wait till it was born and till it got to about eight or ten weeks of age, then I bought my first dachshund, a black-and-tan bitch puppy, as they told me I should have bought a bitch puppy to start off with, because if she wasn't a hundred percent good I could choose a top champion dog to mate her to, and then produce something that was good, which would be in my own kennel prefix. (cited in Halliday, 1987b, p. 59)

Here is another such sentence, this one quoted in A Comprehensive Grammar of the English Language (1985):

Although I know it's a bit late to call, seeing your light still on and needing to get your advice if you're willing to help me, I parked the car as soon as I could find a place and

ventured to come straight up without ringing the bell because, believe me, I didn't want to add waking your baby to the other inconveniences I'm causing you. (1475)

Sentences such as these are not without lexical items. Since they contain several unembedded clauses, however, the ratio of lexical items to unembedded clauses remains quite low. For example, Halliday computes the lexical density of the sentence from the dog-breeder at 1.8 (lexical words) to 1 (unembedded clause).

Halliday is quick to point out that between these two modes of representing experience "are many mixed and intermediate types" (1987b, p. 59). And, of course, one can find examples of spontaneous writing marked by grammatical intricacy and self-conscious speech marked by lexical density. What is most important to recall now is that with the synoptic and dynamic modes, writers have two very different ways of representing experience. Most aspects of experience can likely be represented in both ways, but some will probably be better represented in one than in the other. It does not make the best sense to think of writing as being more complex than unselfconscious speech. That writing often appears to be more complex rests on the fact that the speech that linguists have often analyzed in order to make these contrasts is not spontaneous and unselfconscious but planned and terribly self-conscious. Each mode of representing the world has its own kind of complexity. The complexity of the synoptic mode is that of structures, categories, hierarchies, and relationships between parts of such. This is the complexity of reflection. The complexity of the dynamic mode is that of processes, happenings, actions, and their conditions and results. This is the complexity of action.

#### The Dynamic Style and Sentence Subjects in the Sample of Basic Writing

If Halliday is correct in his presentation and characterization of the synoptic and dynamic modes, how might this information help explain the short subjects in the basic writers' essays? Here Eric Havelock (1986) tells part of the story. In comments about orality, he identifies a kind of communicative purpose that naturally accords with the dynamic style--the purpose of telling a narrative or recounting an activity. Probably the key component of a narrative is an agent. Stories

are about those who act; references to them usually are found in the sentence subjects. Agents are usually people, and writers can refer to people adequately nearly all the time with simple linguistic elements--proper names. Further, agents are often carried over from one action and clause to the next, and when that happens, writers can use even shorter linguistic elements to refer to them--personal pronouns. Storytellers usually refer to an agent or to agents in their subjects, and then they focus in more detail in their predicates on the actions and their circumstances and results.

Although I believe that the nature of the relation between oral narratives and the dynamic style--particularly the relation between oral narratives and the large number of closely related clauses within sentences in the dynamic style--needs to be explored further in the future, what I am suggesting now is that the basic writers in the sample operated to a large extent with the dynamic style in their essays and that they did so essentially because it accords well with a communicative action that they are familiar and comfortable with--the telling of a narrative. It is even possible that a significant portion of their knowledge of the world resides in stories or parts of stories that they have stored up on the basis of their experience. Sentence subjects in their essays refer to agents by means of short linguistic elements--names or pronouns. This writing is as egocentric as it is since the writers themselves or their relatives or close friends (sometimes referred to with you) are the agents the writers are most familiar with and the people they are most inclined to remember and tell stories about. If their predicates are longer than their subjects, it is because the focus in narratives is on actions and their circumstances and results, material usually expressed in sentence predicates.

Consider some evidence for these suggestions that I found when I looked at the sample of writing in terms of kinds of possible complexity. Many of the basic writers' sentences display neither of the kinds of complexity associated with the synoptic or dynamic style; they are neither lexically dense nor grammatically intricate. They are sentences such as the following:

1. "I also am different in the classroom."
2. "My friend of ten acts snobbishly and mean to her parents."
3. "So he has to change his behavior to suit others' needs."
4. "But basically I'm more of a quiet person."

5. "Well, it is not good."
6. "Like my friend, she is sweet and quiet around me."

These sentences obviously have simple structures, and that is not necessarily bad. But if an essay contained only such sentences, many readers would raise questions about it. With so little complexity in its constituent sentences, such an essay would be unlikely to represent complex meanings adequately.

But some of the basic writers' sentences displayed complexity, and it was the complexity of the dynamic style. They are sentences such as these, no two of which were written by the same writer:

1. "If everyone tried to please everyone else, we would all be boring, because no one would have a distinct personality, because everyone would be behaving the same way."
2. "I go to work, I do my job, which is a lot, plus I have to do at least one-half of their job, which really ticks me off because I have to stay to finish my job."
3. "I remember sometimes when I go out with my girlfriend I would be in a grouchy mood before I get to her house, and once I get to her house I'm in a great mood."
4. "When you have associated with all kinds of people, especially those of bad background, you have to act differently because it is essential to not act this way with the high society."
5. "If you are with a close friend you have had for years, you get into a form or groove with that person and you know what to expect from him and he knows what to hear and expect from you."
6. "When I am with a group of friends I tend to go along with the group and follow the general opinion of what to do next, but if I am with just one friend, I tend to do whatever I or my friend wants to do."

None of these sentences is as complex as the examples of the dynamic style presented earlier. But these are well along Halliday's continuum in the direction of such sentences. These sentences contain several clauses, some paratactically and some hypotactically related to others.

As these sentences indicate to an extent, the basic writers in the sample filled their essays with narratives. Some writers formed their entire essays out of one long narrative. Others strung several shorter narratives or anecdotes together. It should be no surprise, then, that of the 263 total subjects in the sample, 189 (71.86%) refer to plausible agents. These particular subjects are elements like I, my friends, and my boyfriend, not elements like this essay, such behavior, and a need to change your behavior, all of which would not be likely to play the role of agent in sentences.

There was only a hint of the synoptic style in the sample. A few sentences have the characteristics of the synoptic, but only a few, and the characteristics are not well developed. These sentences are as follows:

1. "Maybe it is lack of love at home or insecurity."
2. "Changes in a person's behavior may be motivated by some need."
3. "Changes in my behavior pattern from group to group are normal and healthy for me."

I also analyzed the lexical density of a subset of the essays in the sample. I excluded the five shortest and the five longest essays and focused on the five of medium lengths. In these five I found 570 lexical words and 124 unembedded clauses, figures which produced a small lexical density ratio of 4.6 (lexical words) : 1 (unembedded clause).

It appears, then, that to the extent that these writers incorporated complexity in their sentences, it was the complexity associated with the dynamic style. The complexity that appears in their essays is not as pronounced as that in much of the talk of unselfconscious speakers. But this complexity is somewhat unusual for writing, especially for writing which, because it was assigned for an academic class, could be viewed as somewhat formal. To a degree, then, these students wrote in response to the writing assignment as they perhaps speak in natural situations.

#### Some Questions About the Basic Writers and Their Essays

At this point, it is important to address a few questions about the basic writers and their writing. First, can it be proved that these writers wrote as they did because it was impossible for

them to do otherwise? In other words, did they use the dynamic style to recount narratives and anecdotes because that is the only mode of representing meanings that is available to them? The answer to this question is no. Perhaps the impromptu nature of the task or the topic for their essays led these writers to respond to the task in the form of narratives conveyed in the dynamic style. Although some of the clauses explaining the topic could be viewed as leading naturally to a classification or a taxonomy in their focus on such phenomena as "changes in our behavior," many others could be seen as leading naturally to anecdotes and short narratives in their questions about how "we behave" or how "we play different roles in different situations."

Second, can it be proved that most or all students who get classified as basic writers would respond to the writing assignment in a way similar to that of the basic writers represented here? Again the answer is no. These fifteen writers could differ in significant ways from other basic writers.

Finally, can it be proved that the basic writers' responses would differ significantly from those of first-year students in regular composition classes, at my institution or elsewhere? On the basis of the data available, once more the answer is no. Obviously, a good deal of additional research is needed before anyone could approach answering these three questions affirmatively.

This preliminary work, however, raises the possibility that some college students, without kinds of special help, will not be able to move very far along the stylistic continuum toward the synoptic style in their writing. Or this work raises the possibility that some students may have very little sense about when the two styles as well as styles lying somewhere between the two are functionally appropriate. And the seriousness of these possibilities, I believe, justifies some speculation about what would be necessary to enable such students to do the kind of scholarly work that seems to correlate highly with the synoptic style. (I will leave for future research the complex questions about how one can best learn to read synoptic style and about how learning to read synoptic style affects learning to write it.) In wishing to speculate about this matter, in part I am reacting to the notes that have been sounded in the last several years (see especially Stotsky, 1986) to the effect that many basic writers tend to respond to writing

assignments by focusing on themselves, not by reflecting on ideas. If writers happen to be limited to the kind of thinking that seems to correlate with the dynamic mode of representation, I suspect that the challenges these students will face in trying to write certain kinds of academic discourse will be enormous.

### The Synoptic Style and Academia

A good way to get a sense of the kinds and degrees of these challenges is to ask where in academia highly developed synoptic style is most evident. Where are people doing the kinds of work that most accord with or are most greatly facilitated by the synoptic style? My own response to this question would be to point to writing in the sciences.

At this point, I do not have figures available on the lexical densities of entire scientific articles, but I do have figures for the discussion sections of the four scientific articles listed earlier. The average figure for the lexical densities of the discussion sections of these four articles is 14.3 (lexical words) to 1 (unembedded clause). This is the highest figure for lexical density for fairly long passages (the average length for these four discussion sections is 861.5 words) that I have ever seen. In fact, it is not difficult to suppose that writing such as that in these articles lies close to the quintessence of the synoptic mode of representation.

It is particularly easy to believe this after reviewing some of the individual sentences from these discussion sections. Here are three sample sentences, one from each of the articles in physics, chemistry, and ecology. In these sentences the lexical words are underlined (I count initialisms and hyphenated forms as one word):

1. "The 2H NMR spectra of the variously selectively deuteriated deoxythymidines in this study indicate that there is not fast, large-amplitude, internal motion of the molecule, with the exception of the 3-fold jump of the methyl group about the C<sub>3</sub>symmetry axis" (Kintanar et al., 1988, p. 6371) (lexical density = 23 : 1).

2. "Their observations include that of the production of tunable vuv light in the mildly, positively dispersive regions between adjacent three-photon resonances" (Blazewicz and Miller,

1988, p. 2869) (lexical density = 13 : 1).

3. "The ability of shrubs to maintain high conductances at low soil water potential would lead to depletion of water in the rooting zone of soils derived from unaltered rocks" (DeLucia, Schlesinger, and Billings, 1988, p. 309) (lexical density = 18 : 1).

The synoptic mode of representation has several advantages for writers. As I noted above, this mode tends to make the world look like a thing or a product, not like a process. This tendency encourages reflection about and evaluation of the subject matter.

In addition, this mode allows for impersonal expressions of meaning when necessary. Someone could write The planning for the seminar in current approaches to functional semantics is complete without having to specify who did the planning.

Similarly, as Wells (1960) shows, a writer can avoid giving indications about tense. At the point of the compound's evaporation does not indicate when the compound evaporated, evaporates, or will evaporate. Such constructions can be useful in referring to recurring conditions or timeless truths.

But probably the primary advantage of the synoptic mode is that it allows those who are working within extensive networks of information that have been built up over time to communicate with one another efficiently. Synoptic representation provides writers with the means to refer to a great deal of information from earlier portions of a document and from earlier work. As Halliday points out, "when I can say 'the random fluctuations in the spin components of one of the two particles' I am packaging the knowledge that has developed over a long series of preceding arguments" (1987a, p. 149). And such packaging usually requires a surprisingly small amount of space; perhaps the most noticeable characteristic of the synoptic mode is the great amount of information it can express in a little space. Writers do not have to note every time "that particles spin, that they spin in three dimensions, that a pair of particles can spin in association with one another, that each one of the pair fluctuates randomly as it spins, and so on" (Halliday, 1987a, p. 149).

In this light, we can better understand why the subjects of many sentences in the synoptic

style are so long. Writers whose work lends itself well to being reported in the synoptic style usually are not focusing on people or other entities that could serve as agents in narratives. They usually are focusing on things and ideas that are related to many other things and ideas in networks that have been built up over time. Such writers often need several words to indicate precisely what they are focusing on in sentence subjects; frequently they provide such an indication by showing how the focused-upon phenomena relate to other phenomena in the networks or how parts, characteristics, or conditions of focused-upon phenomena relate to the parts, characteristics, or conditions of other phenomena. As a result, such writers often tend to focus in each sentence subject on a great deal of information. The amount of this information usually increases if the writers happen to be describing a scientific experiment, since then they will also frequently use words in their subjects to indicate under what conditions they are focusing on particular phenomena. All of these communicative actions are evident to some extent in the long subjects of the following four examples, one from each of the four scientific articles listed earlier (in each sentence, the complete subject is italicized):

1. "In a recently completed study (Lebel MH, et al.: unpublished data), *differences in the glucose concentration in specimens of cerebrospinal fluid obtained after 24 hours of therapy between children who received dexamethasone and those given placebo* could not be accounted for by differences in glucose concentrations in concurrently obtained blood samples" (Lebel et al., 1988, p. 970).
2. "*The incorporation of the methyl-labeled and methylene-labeled deoxynucleosides into DNA oligomers of defined sequence* is in progress" (Kintanar et al., 1988, p. 6371).
3. "*At first, the effects of a two-photon resonance in THG and other third-order sum- and difference-frequency generation* were investigated" (Blazewicz and Miller, 1988, p. 2869).
4. "*The relatively high values and small fluctuation in predawn XPP for Pinus ponderosa and P. jeffreyi during the summer* suggest that these species are deeply rooted in the altered rocks and have a reliable water supply" (DeLucia et al., 1988, p. 310).

People who can work and write with advantages such as the synoptic style offers can

make progress in a specific field. They can store up knowledge in texts about work that has already been done, they can refer relatively economically to this work, they may well be nudged to think of the next step or steps in a research program, and they can get on with that research. As Halliday notes, with such advantages any given worker and discourse can start where others have left off (1987a, p. 149). That workers in scientific fields may have more reason than workers in other academic fields to find the advantages of the synoptic style especially attractive is underscored by the following claim by William D. Garvey: "More so than any other form of human creativity, scientific progress relates to, builds upon, extends, and revises existing knowledge" (1979, p. 14).

In packaging up so much information in long and complex noun phrases, however, the synoptic style leaves many semantic relationships unexpressed. Those who have not followed the work and discourse in a field, therefore, may not understand sentences at all or may find them ambiguous. Consider the following sentence from the chemistry article: "Labile deuterons were reexchanged by lyophilizing from doubly distilled water three additional times" (Kintanar et al., 1988, p. 6368). Readers who have followed little such work might be completely mystified by this sentence. Readers who know a little more can wonder whether the deuterons were reexchanged from doubly distilled water, or whether the deuterons were reexchanged by one kind of lyophilizing, that is, lyophilizing from doubly distilled water. As it turns out, chemists who specialize in the area that Kintanar and his coauthors are writing about do not find this sentence ambiguous. For them the deuterons were reexchanged from doubly distilled water. They do not see the sentence as ambiguous because they know precisely what lyophilizing is--freeze-drying.

The synoptic style, then, has what Halliday calls an expert grammar (1987a, p. 149). If you are one of the experts in a field, you will face few problems with it. You will be able to understand the great amount of information expressed and identify the relationships that are left unexpressed. In fact, you probably will not have much more difficulty comprehending the synoptic style than you would comprehending the dynamic style. Perhaps you will even develop a specialized kind of reading process to use when working with material in the dynamic style. But if

you are not one of the experts, you may well be shut out.

It is not the case that the synoptic style cannot be misused. Some misuses may cause nothing more serious than inconvenience or wasted time; others may cause serious harm. People can use it to give material an impersonal expression when it should not have such. People can use it to represent aspects of the world that perhaps are better represented with the dynamic mode. People can use it to try to present material as having synoptic complexity when in fact the material has no such complexity. People can use it to package up information to be taken for granted (by expressing that information in sentence subjects; see Vande Kopple, 1989) that really should not be taken for granted; the information deserves to be proposed and debated. People who are not really experts in an area can imitate the style with little appropriate substance in an attempt to pass themselves off as experts. And experts can use it to keep non-experts out of the experts' areas.

These potential misuses might lead some people to argue for a radical revision of the way that scientists write. In the light of what the synoptic style makes possible for scientists, however, I would urge caution about revisions that would change the essence of the synoptic style.

#### The Synoptic Style and Student Writers

I now return to the issue of what can be done if some students cannot move very far along the stylistic continuum toward the synoptic style in their writing. Before exploring this issue in more depth, I should emphasize that I am not suggesting that writers in all academic fields use synoptic style as highly developed as it is in scientific writings. In my view, it is likely that scientists writing in specialized journals to other scientists generally use the most highly developed synoptic style found in academia. Writers in some other academic fields move along the continuum in the other direction, toward dynamic representation. That may be because in their fields there is not as much information built up over time, because they choose not to pay much attention to the information that has been built up over time, because they know their readers are not familiar with the body of built-up information that they will be writing about, or because they are recounting the story of an exploration or the working out of a discovery, among other

possibilities.

In this light, it seems that for those students who are not hoping to enter an academic field like one of the sciences, not being able to write the synoptic style may have few, if any, negative effects. However, their situation does raise the issue of how healthy it is for a society to have some of its members isolated from first-hand information about certain significant academic endeavors and their potential effects on society.

But what could teachers do if it becomes clearly established that students like the basic writers represented here have enormous difficulties representing the world synoptically and if one or more of them make it clear that they want to take steps to pursue a career in a scientific field? A related question is whether teachers should introduce aspects of the synoptic style even to those students who are undecided about the kind of career they wish to pursue or who might not dare to believe that they could pursue a career in a scientific field. Discussing developing writers in general, Rei R. Noguchi (1991) points out that they will almost certainly face bleak possibilities if they learn few of the stylistic options available to them in an academic field as well as few of the consequences of choosing particular options.

But the challenges inherent in teaching others to write the synoptic style are great. In the first place, the style itself is complex, and it usually rests on a vast amount of accumulated information. Second, as Susan Peck MacDonald (1992) shows in analyses of the ways in which different disciplines generate and disseminate information, scholars who study aspects of discourse across academic disciplines need to know more than they now do about the stages writers go through as they move from being novices to being experts in an area. Do all writers go through the same or similar stages? In how many different kinds of relationships can texts produced by novices or by apprentices stand relative to conventionally accepted texts in an academic area? And once teachers know the answers to such questions, as Kim Brian Lovejoy (1991) points out, they will need to learn how best to communicate those answers to their students.

Anyone who responds to such challenges will immediately face at least two separate tasks: (1) helping students learn and represent to themselves the information that has been built up

in a scientific field, and (2) helping those students learn how to write about such information synoptically (also see Bartholomae (1985) on such tasks and related ones).

Many of the proposed responses to challenges such as those described above center on helping students learn strategies to modify their styles. One of the strategies often proposed is to identify the most frequently used syntactic structures in an area and teach students how to form and parse them (see Cheong, 1978). If teachers were to adopt this strategy to help students produce synoptic style on the level of or approaching that in the four articles I examined, they would have to concentrate with their students on the ways in which long and complex noun phrases are formed and related to one another.

Or perhaps these teachers could devote some time to sentence imitation, working with sentences that students can understand well enough to imitate but that are fairly dense lexically. As students get better at these exercises, they can try imitating sentences that are more and more lexically dense. Following Frank D'Angelo (1983), teachers could examine a passage of prose very closely with their students, have their students write about the dominant characteristics of that prose and the effects of those characteristics on them, and then imitate the style of the passage.

Another possibility for instruction would be to take a passage of fairly great lexical density and make it the basis for a kind of cloze test. Teachers could omit some of the nouns in noun phrases and ask students to try to fill them in. Frequently students enjoy discovering how closely their predictions match words in the original text, and they often argue for their own choices as preferable to the author's choices.

A slightly more difficult technique involves taking a passage written in dynamic style and asking students to rewrite it in a more synoptic style. As Halliday (1987b) shows, students could work on transforming sentences or parts of sentences such as I had to wait, I had to wait till it was born and till it got to about eight or ten weeks of age, then I bought my first dachshund, a black-and-tan bitch puppy into sentences such as Some eight or ten weeks after the birth saw my first acquisition of a dachshund, a black-and-tan bitch puppy. During and after such exercises, students should discuss how the various samples they produce relate to one another on the stylistic

continuum running between the dynamic and the synoptic and in what contexts the various samples would best fit.

Although I think that all these strategies can be of some help to students as they learn to write synoptically, I agree with Charles Bazerman (1988) that such strategies may lead students to privilege the code of communication and not learn enough about the “forms of life” (p. 320) and work environments that scientific writers actually experience. My suspicion is that students will not be fully successful outside of a context in which teachers help them learn and do meaningful work in a scientific field.

The kind of educational program that I would propose to help students do this learning and working, the kind that would constitute some but not all of their educational experience (perhaps as much as a quarter of their time each year for four years), would involve teams of workers with differing levels of expertise in a scientific field, perhaps something like an expansion of what happens in many research laboratories in graduate school. Each student would join a team working in one clearly defined line of research. Leading each team would be a person or persons who know the information that has been built up in that line of research and are actively conducting and directing research in that line. Below them would be students classed according to their level of expertise with the information and methods in that line of research. Students such as I am primarily concerned with in this essay would be entry-level apprentices. They would, under the guidance of students with more experience in the line of research, read, analyze, and practice producing documents that are related to work in the line of research but that are not as complex synoptically as the actual documents in that line of research. Later these students could read and analyze documents that are in fact parts of that line, write summaries and evaluations of these documents, and have their summaries and evaluations critiqued by the students guiding them. They would also engage in intense study and review of the words and phrases that appear commonly in that line of research as well as the organizational patterns and rhetorical moves (cf. Swales, 1990) that are used in research reports. As these entry-level apprentices gain experience, they could help carry out some sharply focused aspects of the research that the team is working on

and write about those aspects in formats that the team can use in putting together its reports for publication. These students should also read and critique written reviews of the team's reports in order to develop a clear sense of the expectations held by other researchers who are readers for research reports in this line.

Christina Haas (1994) reports on a situation that is quite similar to what I am proposing. One of her research subjects, a student named Eliza, accepted a work study job when she was a junior in college. For this job, Eliza helped to grow protein mutants in the lab of one of her biology professors. On the job, Eliza was supervised by a graduate student named Shelly. Shelly became a mentor for Eliza, monitoring her work and helping her to solve problems. Haas noticed that as a result of Eliza's work in the lab, she seemed to change significantly as a student of biology. For instance, Eliza "exhibited a range of reading strategies--skimming, reading selectively, moving back and forth through texts, reading for different purposes at different times" (1994, p. 64). Further, Eliza read texts "not solely to glean information but to learn about conventions and structures" (1994, p. 64). It was not Haas's purpose to chart changes in Eliza's sentence style, but my prediction would be that Eliza's work in the lab probably made her sentence style more synoptic.

Eliza's experience in a lab came as a result of a job, on this job she was given what I would judge to be fairly important responsibilities, and the job did not start until she was a junior in college. I would recommend that such experiences be made part of the curriculum, that they be made available to students who would not at first have to take on serious responsibilities, and that they begin for students when those students are in the first year of college. Something like what I am recommending apparently already exists, for Haas (1994) reports that the Chemistry Department at Pennsylvania State University tries to make a one-credit lab-experience course possible for first-year chemistry students.

I realize that research groups such as I am proposing would be heavily labor intensive, that they would be difficult to administer and coordinate, that they would call into question traditional modes of grading, and that they would pose all kinds of challenges in the realm of

interpersonal relationships. Furthermore, academic institutions would probably have to develop programs to acquaint students having various levels of interest in work in science with the various research groups that they could consider becoming apprentices with. Yet such research groups would offer students the chance to learn the information accumulated in a line of research, they would operate so that students could move through stages of learning, they would--sparingly at first but rather extensively later on--offer the students responsibility for important actions, and they could offer students some collegiality, some sense of being a part of a team. My fear is that unless academic institutions establish such teams or something like such teams, many students will be largely limited communicatively to what they can read and convey in stories based on personal experience. If students are limited in this way, they will probably be shut out of the very fields in which they would like to work.

Note

I wish to thank Marlys Admiraal, Gordon Bordewyk, and Dean Ward for help with drafts of this essay.

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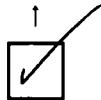
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